

ABSTRACT OF THE DISCLOSURE

A quantum communication apparatus is used in operations to generate entanglement between the two physical system ensembles and operations to extend the distance between entangled ensembles by connecting  
5 pairs of entangled ensembles. The apparatus uses only passive elements without any actuating parts, active devices having no mechanically actuating parts, such as an electro-optical device capable of ultrahigh-speed  
10 operation, and a laser source capable of generating high-speed pulse trains or a continuous wave laser source. The apparatus can rapidly execute light irradiation necessary for entanglement generation and connection, and detection of a generated photon at the  
15 needed sites within a decoherence time of the physical system.